

Reduction in the Metabolic Cost of Human Walking Gaits Using Quasi-Passive Upper Body Exoskeleton

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Abstract : Human walking gait is considered to be the most efficient biped walking gait. There are various types of gait human follows during locomotion and arm swing is one of the most important factors which controls and differentiates human gaits. Earlier studies declared a 7% reduction in the metabolic cost due to the arm swing. In this research, we compared different types of arm swings in terms of metabolic cost reduction and then suggested, designed, fabricated and tested a quasi-passive upper body exoskeleton to study the metabolic cost reduction in the folded arm walking gate scenarios. Our experimental results validate a 10% reduction in the metabolic cost of walking aided by the application of the proposed exoskeleton.

Keywords : arm swing, MET (metabolic equivalent of a task), calorimeter, oxygen consumption, upper body quasi-passive exoskeleton

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